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ABSTRACT OF AN ADDRESS BY MR. E. WHYMPER.

"TWENTY THOUSAND FEET ABOVE THE SEA."

In the discourse which was delivered by Mr. Edward Whymper on November 13th, 1900, to the American Geographical Society, he pointed out that the initiation of mountain-climbing and mountain-travel in Europe was due to the young Genevese Professor of Philosophy, Horace Benedict de Saussure, who offered a considerable reward in 1760, and in later years, to any one who would discover a practicable way to the summit of the great Mont Blanc. The earliest attempts to ascend the mountain were made from the Valley of Chamonix; then others were made by way of the Val Montjoie, and ultimately the summit was gained from the original direction.

Mr. Whymper then proceeded to show the manner in which mountain-climbing is practised at the present time, and illustrated this part of his discourse with an extensive series of lantern-slides, showing mountaineers at work upon rock, snow and ice, climbing and cutting, ascending and descending, and crossing snow-bridged crevasses, etc., etc. He laid stress upon the value of rope to mountain-climbers (when it is properly used), and, while paying homage to the courage and enterprize of the early mountaineers, expressed the opinion that it was surprising they did not more often come to grief, through their complete ignorance of everything that might occur to them above the snow-line. He particularly insisted upon the importance of mountaineers acquiring a mastery of the art of balancing, and upon the necessity of their keeping upon their legs; and emphasized his remarks by referring to the catastrophe which occurred upon the first ascent of the Matterhorn through the inability of one of the party to maintain his balance. When he was in a position where a slip meant almost certain death, he lost his footing and his life, and caused the death of three of his comrades.

The lecturer then passed on to speak of the foundation of the Alpine Club (the parent of a number of similar institutions which have now been established throughout the world, embracing more than 100,000 members), and of the competition which was displayed by its associates, soon after its foundation, in scaling the then untrodden summits of the highest Alps. "By the year 1865 scarcely any of the principal peaks remained unascended." A superb series of views of the highest Alps was shown in illustration, and it was pointed out the rule is that all mountains have an accessible side, and one side which is apparently or obviously easier to ascend than all others. "In 1865, one mountain in the Alps—one of the greatest—remained unascended, which was an exception to this rule. The peerless and incomparable Matterhorn is a mountain which is almost *unique* in appearing nearly equally inaccessible upon *all* sides, no matter the direction from which it may be regarded;" and this was demonstrated by means of a magnificent set of lantern-slides, taken from nearly every point of the compass.

Mr. Whymper next gave a sketch of his (the first) ascent of this mountain, and said that the earliest efforts to scale it were made from the south-west, as that side, from being much broken up, appeared to offer some chance of success. It was not until after he had made nine different attempts to scale it from the south and south-west side he began to entertain the opinion that an easy and natural way to the top would be found over the northeastern face, although that was one of the sides which appeared to be hopelessly inaccessible; and he explained in the following passage why he was led to entertain this idea. "I had noticed," he said, "that the main mass of the mountain was composed of regularly stratified rocks, dipping to the south and west; and that, in consequence of this, on the south side, the exposed surfaces were frequently (or generally) slabs of rock sloping *downward* and *outwards*, with their fractured edges often actually overhanging. This caused much of the difficulty in climbing the southern side of the mountain. I inferred that, if the same structure extended right through the peak, the great northeastern face, instead of being hopelessly inaccessible, would be quite the reverse—that, in fact, it would be a great natural staircase, with steps inclining *inwards;* and, if that was so, its smooth aspect would be of no importance, for the smallest steps, inclined in that fashion, afford good footing. *This deduction was the key to the ascent of the Matterhorn.*"

After giving an account of this ascent, the lecturer passed on to his two ascents of Chimborazo, in the Republic of Ecuador. Although Humboldt, Boussingault, and many others had endeavored to reach the summit of this great mountain, Mr. Whymper was the first to succeed in doing so, in 1880, and his ascents are the only ones which have been effected down to the present time. In making this expedition several objects were kept in view, and first amongst them was the study of what is called "mountain sickness," a term which is employed indiscriminately for the various affections which occur to human beings at great altitudes. These effects differ in different individuals, though they are all primarily due, according to Mr. Whymper, to the diminution in atmospheric pressure which is experienced as one ascends. In the case of himself and of his party no unpleasant effects were experienced until the height of 16,660 feet above the sea had been reached; but at that altitude (and at the pressure of 16.500 inches) both he and the two mountaineers he had brought from Europe were rendered incapable (or, to use his own expression, were placed *hors de combat*) through their inability to imbibe a sufficiency of air. In course of time both he and his assistants accommodated themselves to the conditions: 1, By breathing deeper; 2, by more frequent respirations; and 3, by eating less; and after passing a month at great elevations they were so far righted that they were unable to trace any effect due to diminution in atmospheric pressure, except that they were weaker (which was attributed to their having eaten much less than the amounts which they habitually consumed at low levels), and that at elevations of 16,000 feet and upwards they were unable to sustain active exertion except by breathing through open mouths.

In conclusion, Mr. Whymper referred to his ascent of Cotopaxi, "the loftiest of all volcanoes that are in working order," and showed views of its summit, etc., etc. The ascent was effected from the west, and an encampment was made on that side, about 100 feet below the most elevated point of the crater, at a height of 19,500 feet above the sea. The stay there of 26 hours, to study the crater by night and other matters, is probably the greatest length of time that any human beings have ever remained at so considerable an elevation.